



## Wood Furniture Coating Operations

### Description

The wood furniture industry is characterized by mostly small plants typically producing wood household furniture, kitchen cabinets, television cabinets, office furniture and store fixtures. There are 313 wood furniture facilities in Indiana whose Standard Industrial Classification (SIC) codes are 2434, 2511, 2512, 2517, 2519, 2521, 2531, or 2541. In most wood furniture manufacturing facilities, coatings are applied to enhance the durability and aesthetic qualities of the product. The primary methods used to coat wood furniture are flat line finishing and spray coating. Spray coating is the most common.

A complex series of coating steps and application methods are involved in finishing wood products. Coatings are usually applied in the following order: stain, wash coat, filler, sealer, highlight coat and topcoat. Emissions occur primarily from the solvents used during the coating process. Solvents are most often volatile organic compounds. In general, less than one-half of the materials sprayed through the spray gun adheres to the product. The rest of the coating is lost to the environment. According to U.S. EPA, the wood furniture industry uses almost twice as much solvent in coating operations as the automotive manufacturing industry.

The wood furniture coating operations at major sources of hazardous air pollutants are subject to a "National Emissions Standard for Hazardous Air Pollutants." This federal regulation not only restricts the chemicals that may be used for coating operations, it also requires the implementation of "work practice standards." The work practice standards include a written work practice plan, a solvent accounting system, a leak detection and maintenance plan and an employee training program. The control requirements outlined in the rule include both pollution prevention options and end-of-pipe controls. Major sources, defined as those sources that have the potential to emit 10 tons per year of a single hazardous air pollutant or 25 tons per year of any combination of hazardous air pollutants, must comply by December 7, 1998.

In 1995, prior to the issuance of the federal rule, the Indiana Department of Environmental Management (IDEM) developed a rule for wood finishing operations in Clark, Floyd, Lake, and Porter Counties, 326 IAC 8-11, Volatile Organic Compound Rules; Wood Furniture Coatings. The rule specifies application

techniques but does not set volatile organic compound limits for coatings. In this rule, the control method for coatings is reformulation or add-on controls and for clean-up solvents, the method is solution reformulation or work practice changes. The rule applies to sources with volatile organic compound emissions over 25 tons per year.

## Emission Reductions

IDEM predicted that the state rule would reduce volatile organic compound emissions by 30 percent. The estimated reductions nationwide for the federal rule are 50 to 70 percent depending on the technology option selected.

## Cost Effectiveness

IDEM estimated that the cost effectiveness of the state rule ranges from \$2,000 to \$6,500 per ton of volatile organic compound reduced.

## Implementation Issues

If an area has few wood manufacturing facilities, the emissions reductions would be minimal.

The state rule is similar to the federal rule except that the state rule only applies to sources in Lake, Porter, Clark, and Floyd Counties, is more stringent on topcoats, requires hands-on training, and regulates volatile organic compounds instead of hazardous air pollutants.

## Comments

To learn more about wood finishing operations, visit the IDEM web site at [www.state.in.us/idem/ctap/woodref.html](http://www.state.in.us/idem/ctap/woodref.html) or contact Jean Beauchamp at (800) 451-6027 press 0 and ask for extension 2-8424 or dial direct at (317) 232-8424.